

Preetika Kaur

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EDUCATION

- Ph.D.** **University of Wyoming, Laramie, WY**
Civil Engineering – Hydrologic Sciences (GPA- 4.0/4.0)
Dissertation: Evaluation of L-band InSAR on sensitivity to liquid water content, topography, and land cover to determine feasibility for global snow water equivalent applications
Advisor: Dr. Ryan Webb
- M.S.** **Auburn University, Auburn, AL**
Biosystems Engineering – Soil and Water Engineering (GPA- 4.0/4.0)
Thesis: Effects of tillage practices and cover crops on X-ray computed tomography derived soil pore characteristics
Advisor: Dr. Jasmeet Lamba
- B.S.** **Punjab Agricultural University, Ludhiana, Punjab, India**
Agricultural Engineering (GPA- 3.49/4.0)
Project: Effect of ozone treatment on storage life of processed products (Gram flour, Semolina, wheat grits, Barley flour, Pearl millet flour, and refined wheat flour)

RESEARCH WORK EXPERIENCE

- Aug 2023-Present** **Graduate Research Assistant**, Civil Engineering, University of Wyoming
- Conduct field-based data collection for snow-related parameters and model snow in Jemez Mountains to make connections between snowpack liquid water content, canopy cover, and incidence angle with UAVSAR datasets
 - Develop machine learning models to precisely predict snow water equivalent (SWE) and snow melt
 - Create a global map of SWE products and curate datasets for publication in high-impact journals
- Jan 2021-Aug 2023** **Graduate Research Assistant**, Biosystems Engineering, Auburn University
- Collect field-based soil columns for X-ray CT scanning to explore intricate details of soil porous media
 - Conduct laboratory experiments for determination of physical and chemical properties of collected soil samples
 - Administer computer-based image processing using ImageJ and data analysis for publication in high-impact journals

TEACHING EXPERIENCE

- Aug–
Dec 2022** **Graduate Teaching Assistant**, BSEN 6220- Geospatial Technologies in Biosystems Engineering, Auburn University
- Assist 57 undergraduate students with GPS (Trimble-connected device) and ArcGIS-related labs
 - Conduct grading for student assignments to ensure their understanding of the topic
 - Create lab assignments for students related to Python interface within ArcMap

INTERNSHIP & WORKSHOPS

**August
2024** **SnowEx Hackweek**, eScience Institute, University of Washington, Seattle, WA

**July
2024** **AI+Science Summer School**, Data Science Institute, University of Chicago, Chicago, IL

- March
2024** **SNOWWI Field Campaign**, Grand Mesa, CO (in-person)
- Operated specialized instruments including Infrasn timer, WISER probe, capacitance plate, magna probe, and ground penetrating radar for comprehensive snow analysis.
 - Demonstrated proficiency in snow pit measurements, utilizing density wedge cutters, federal samplers, and snow stratigraphy techniques.
 - Acquired advanced skills in data collection, analysis, and interpretation to support successful field campaign objectives.

- Nov
2023** **ESIL Hackathon** Environmental MosAIC, University of Colorado, Boulder, CO (online)
- Worked with the Cyverse discovery environment
 - Created a data cube for a machine learning model to predict fire occurrence in Alaska under variable climatic conditions
 - Advanced skills on GitHub, AI model exploration, R-Python

- Oct
2023** **GeoSMART Hackweek** eScience Institute, University of Washington, Seattle, WA (in-person)
- Worked with the Cryocloud computing environment
 - Optimized a machine learning model for a snow extrapolation team project

- Advanced skills in machine learning models, geospatial cloud computing, git, and python

Aug 2023 **Image Datapalooza 2023** Imageomics Institute, The Ohio State University, Columbus, OH (in-person)

- Collaborated with an interdisciplinary group of scientists
- Worked on land coverage data exploration for iNaturalist image locations
- Advanced skills using software carpentry workshops

Jun-Aug 2019 **Summer Intern** Supply Chain Management Department CLAAS India Pvt. Ltd., Morinda, Punjab, India (in-person)

- Completed a project titled ‘Reverse Logistics’ that covered analysis of the current problems faced by the company.
- Applied reverse logistics to improve the supply chain management system.

SKILLS

Computer: ArcGIS, digital image analysis with Image-J software, data analysis with Excel, Python, R, SAS, hydrologic modeling with HEC-HMS, Modflow, SWAT, Campbell data logging, Met station data processing, CUAHSI Hydroshare.

Instrumentation: Campbell data loggers, soil moisture sensors, Leaf area index (LAI) meters, experience in Soil Water Engineering Laboratory (Auburn University) for Rainfall simulation experiments by use of delicate instruments such as peristaltic pump, bromide probes, and measurement of basic physical properties using pH and EC probes.

Equipment: LeBlond engine lathe and band saw

Languages Known: Fluent in English, Punjabi, Hindi

AWARDS & HONORS

- Master’s Thesis Award by Auburn University (2024)
- Funding support (travel and accommodation) by UW eScience institute for 2024 SnowEx hack week (2024)
- International student scholarship for Fall 2024/ Spring 2025 academic year by the University of Wyoming (2024)
- Travel scholarship for 2024 AI+Science Summer School at the University of Chicago Data Science Institute (2024)
- Outstanding Masters Student Award by Auburn University (2024)
- Funding support for Arctic Science Summit Week (ASSW) in Edinburgh, Scotland, UK by the International Arctic Science Committee (IASC)- online attendance (2024)
- Student assistantship for ESRI’s Developers Summit in Palm Springs, California (2024)
- Graduate student assistantship for ESRI’s Federal GIS conference in Washington DC (2024)

- Travel grant by Imageomics Institute at the Ohio State University for Image Datapalooza event, Columbus, Ohio (2023)
- Graduate student paper award (1st position) by AABFEIO ASABE 2023 held at Omaha, Nebraska (2023)
- Presentation excellence award ASABE 2023 held at Omaha, Nebraska (2023)
- Graduate student travel award by Auburn GSA for ASABE conference, Omaha, Nebraska (2023)
- Graduate student travel award by Auburn GSA for ASA SSSA CSSA conference, Baltimore, Maryland (2022)
- 100+ Strong Women Abroad Women in Engineering Scholarship at Auburn University (2022)
- R.N Kaul Memorial Scholarship for Agricultural Engineering Female students in their senior year at Punjab Agricultural University (2019-2020)
- Punjab Agricultural University Merit scholarship (2016-2019)

PUBLICATIONS

Kaur, P., Lamba, J., Way, T. R., Balkcom, K. S., Sanz-Saez, A., & Watts, D. B. (2023). Effects of tillage practices on X-ray computed tomography derived soil pore networks. *Soil & Tillage Research* <https://doi.org/10.1016/j.still.2024.106035>.

Kaur, P., Lamba, J., Way, T. R., Balkcom, K.S., & Watts, D.B. (2023). Effect of Image Resolution and Soil Core Diameter on Soil Pore Characteristics Quantified Using X-Ray Computed Tomography. *Environmental Science and Pollution Research* (Submitted). Preprint available at <http://dx.doi.org/10.2139/ssrn.4540434>

Kaur, P., Lamba, J., Way, T. R., Sandhu, V., Balkcom, K. S., Sanz-Saez, A., & Watts, D. B. (2023). Cover crop effects on X-ray computed tomography–derived soil pore characteristics. *Journal of Soils and Sediments*, <https://doi.org/10.1007/s11368-023-03596-7>

Pendola, A., Dai, Y., Smith-Murphy, K., Mohundro, A., Odeniyi, O., Billingslea, W., Taylor, K., Woods, A., **Kaur, P.,** Rabinowitz, N. (Revise & Resubmit). The ecology of opportunity: Environmental health and student achievement. (Submitted)

POSTER & ORAL PRESENTATIONS

Kaur, P., Lamba, J., Way, T. R., Balkcom, K. S., Sanz-Saez, A., & Watts, D. B. (2023, July). Temporal and spatial variation of X-Ray CT derived soil pore networks under conventional and conservation tillage practices. [Poster]. ASABE AIM 2023, Omaha, Nebraska. [**Presentation excellence award**]

Kaur, P., Lamba, J., Way, T. R., Sandhu, V., Balkcom, K.S., Sanz-Saez, A., & Watts, D. B. (2023, July). Cover crop effects on X-ray computed tomography–derived soil pore characteristics. [Oral Talk]. ASABE AIM 2023, Omaha, Nebraska.

Kaur, P., Lamba, J., Sandhu, V., Way, T.R., Balkcom K.S., (2022, November). Effects of Cover Crops and Tillage Practices on Soil Pore Characteristics. [Oral Talk]. 2022 ASA, CSSA, SSSA International Annual Meeting, Baltimore, Maryland.

Kaur, P., Lamba, J., Way, T. R., Sandhu, V., Balkcom, K.S., (2022, October). Quantifying effects of soil management practices on X-ray computed tomography derived soil pore properties. [Poster]. 2022 Graduate Engineering Research Showcase, Auburn University, Alabama.

Kaur, P., Lamba, J., Way, T. R., Sandhu, V., Balkcom, K.S., (2022, October). Effects of Cover Crops and Tillage Practices on Soil Pore Characteristics. [Poster]. College of Agriculture Graduate Student Poster Showcase, Auburn University, Alabama.

Kaur, P., Lamba, J., Way, T. R., Sandhu, V., Balkcom, K.S., (2022, September). Effects of Cover Crops and Tillage Practices on Soil Pore Characteristics. [Poster]. 2022 Alabama Water Resources Conference, Perdido Beach Resort, Orange Beach, Alabama.

Kaur, P., Lamba, J., Way, T. R., Sandhu, V., Balkcom, K.S., (2022, September). Effects of Image Resolution and Sample Size on Soil Pore Characteristics. [Lightning Talk]. 2022 Alabama Water Resources Conference, Perdido Beach Resort, Orange Beach, Alabama.

Kaur, P., Budhathoki, S., Malhotra, K., Lamba, J., and Way, T.R., (2022, March). Biopore Quantification based on macropores shape in pastures. [Poster]. Auburn Research Student Symposium, Auburn University, Alabama

Kaur, P., Budhathoki, S., Malhotra, K., Lamba, J., and Way, T.R., (2021, October). Quantification of Biopores based on Macropores Shape in Pastures. [Poster]. College of Agriculture Graduate Student Poster Showcase, Auburn University, Alabama.

Kaur, P., Budhathoki, S., Malhotra, K., Lamba, J., and Way, T.R., (2021, October). Biopore Quantification based on Macropores Shape in Pastures. [Poster]. Graduate Engineering Research Showcase, Auburn University, Alabama.

UNIVERSITY & COMMUNITY SERVICE

- University of Washington eScience institute **hack week organizer** (May 2024- August 2024)

- **Cultural representative** for the Indian Student Organization at UWyo for 2024-2025 academic year (August 2024- May 2025)
- **Marketing head** for Society of Women Engineers (SWE) at UWyo (August 2024- May 2025)
- India student organization at UWyo volunteer: Organized and coordinated the cultural programs for the highly anticipated 2023 Diwali event at UWyo (October 2023)
- **Outreach Research-** Auburn University, Auburn, Alabama: The Ecology of Opportunity: Environmental Health and Student Learning in Alabama
- **Alpha Epsilon** – Vice President and Member, an honor society for Agricultural and Biological Engineers. (August 2022- July 2023)
- **First Year Mentorship Program-** Mentored a first-year graduate student (Rachel Day) who joined Auburn University from fall 2022 for a PhD in Biosystems Engineering. (August 2022- July 2023)
- **1887 Graduate Student Ambassador-** Graduate student representative of Auburn family and Auburn creed. Volunteered for new graduate student welcome event & orientation (August 2022)
- **Gator-Byte Testing at Chewacla River-** Assisted Dr. Eban Bean (Assistant Professor and Extension Specialist of Urban Water Resources Engineering at the University of Florida) and Dr. Eve Brantley to measure water quality (April 2022)
- **E day volunteer** for Samuel Ginn College of Engineering, Auburn University. Represented Biosystems Engineering Department (March 2022 and March 2023)
- **The Big Event** by University Program Council at Auburn University, Auburn. Community service for residents of Auburn (February 2022)
- **Parkerson Mill Creek Clean-up** by AU Water Resources Center, Auburn stream restoration (February 2022)
- **Tree Planting Event** by Office of Sustainability, Auburn University, Auburn. Planted shortleaf pine trees at the Kreher Preserve and Nature Center (January 2022)
- **Gameday Recycling Event** by Waste Reduction and Recycling Department at Auburn University, Auburn. Convinced tailgaters to put and separate all the trash in the provided trash bags (October 2021)

PROFESSIONAL STUDENT MEMBERSHIPS

- American Society of Agricultural and Biological Engineers (ASABE)
- Association of Agricultural, Biological, and Food Engineers of Indian Origin (AABFEIO)
- Alpha Epsilon Honor Society
- Agronomy Crop and Soil Sciences Societies of America (ASA, CSSA, SSSA)
- Society of Women Engineers (SWE) at Auburn University